WHAT WE CLAIM IS:

1. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of the zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein the following conditions are satisfied:

$$0.5 < |F_2/F_3| < 1.2 \qquad \cdots (1)$$

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \qquad \cdots (10)$$

where F_i is a focal length of an i-th lens group and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

2. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming from a

wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein the following conditions are satisfied:

$$0.49 < |L_3/L_2| < 1 \qquad \cdots (2)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \qquad \cdots (10)$$

where L_i is an amount of movement of an i-th lens group from the wide-angle end to the telephoto end and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

3. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the object side to the image plane side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and

designed to be movable for zooming, wherein the following conditions are satisfied:

$$2 < (F_{3.4W})/IH < 3.3 \qquad \cdots (3)$$

$$2.5\text{ mm} < f_{B(min)} < 4.8\text{ mm} \qquad \cdots (10)$$

where $(F_{3.4W})$ is a composite focal length of the third and forth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

4. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein said third lens group comprises, in order from an object side thereof, a positive lens component convex on an object side thereof and a cemented lens consisting of a positive lens element convex on an object side thereof and a negative lens element concave on an image plane side thereof, and both the object-side positive lens component and the cemented lens in said third lens group are held in a lens barrel while the object-side convex surfaces thereof abut peripherally or at

peripheral several spots against said lens barrel, and the following condition is satisfied:

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

5. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of the zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein the following conditions are satisfied:

$$0.5 < |F_2/F_3| < 1.2 \quad \cdots (1)$$

$$0.49 < |L_3/L_2| < 1 \quad \cdots (2)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where F_i is a focal length of an i-th lens group, L_i is an amount of an i-th lens group from the wide-angle end to the telephoto end, and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom

lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

6. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of the zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein the following conditions are satisfied:

$$0.5 < |F_2/F_3| < 1.2 \quad \cdots (1)$$

$$2 < (F_{3.4W})/IH < 3.3 \quad \cdots (3)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where F_i is a focal length of an i-th lens group, $(F_{3.4W})$ is a composite focal length of the third and forth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

7. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of the zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein the following conditions are satisfied:

$$0.49 < |L_3/L_2| < 1 \quad \cdots (2)$$

$$2 < (F_{3.4W})/IH < 3.3 \quad \cdots (3)$$

$$2.5 \text{ mm} < f_{B(min)} < 4.8 \text{ mm} \quad \cdots (10)$$

where L_i is an amount of movement of an i-th lens group, $(F_{3.4W})$ is a composite focal length of the third and forth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

8. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power

ing power and designed to move from the object side to an image plane side of the zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein the following conditions are satisfied:

$$0.5 < |F_2/F_3| < 1.2 \quad \cdots (1)$$

$$0.49 < |L_3/L_2| < 1 \quad \cdots (2)$$

$$2 < (F_{3.4W})/IH| < 3.3 \quad \cdots (3)$$

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where F_i is a focal length of an i-th lens group, L_i is an amount of movement of an i-th lens group, $(F_{3.4W})$ is a composite focal length of the third and forth lens groups at the wide-angle end, IH is a radius of an image circle, and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

9. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, which further satisfies the following condition:

$$0.6 < |F_2/F_3| < 1 \quad \cdots (4)$$

where F_i is the focal length of an i-th lens group.

10. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein said fourth lens group is moved in an optical axis direction for focusing.

11. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, which further satisfies the following condition:

$$0.3 < |F_3/F_4| < 0.8 \qquad \cdots (5)$$

where F_i is the focal length of an i-th lens group.

12. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, which further satisfies the following condition:

$$0.4 < |\beta_{2T}| < 1 \qquad \cdots (6)$$

where β_{2T} is a transverse magnification of the second lens group.

13. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein said fourth lens group consists of one positive lens element.

14. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein said third lens group consists of three lenses elements or a positive lens element, a positive lens element and a negative lens element in order from an object side thereof.

15. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein at least one surface in said third lens group is defined by an aspherical surface.

16. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein at least one surface in said fourth lens group is defined by an aspherical surface.

17. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein at least one surface in said second lens group is defined by an aspherical surface.

18. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power, and designed to move from the object side to an image plane side of the zoom lens system for zooming from a wide-angle end to a telephoto end ~~of said~~ zoom lens system, a third lens group having positive refracting power and designed to move from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable for zooming, wherein said first lens group consists of one positive lens element, a lens element located nearest to the object side in said second lens group is defined by a negative lens element, and the following conditions are satisfied:

$$\nu_{21} < 40 \quad \cdots (7)$$

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \quad \cdots (10)$$

where ν_{21} is an Abbe's number of said negative lens element located nearest to the object side in said second lens group, and $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

19. The zoom lens system according to claim 18, which satisfies the following condition:

$$\nu_{21} < 35 \quad \cdots \text{(8)}$$

20. The zoom lens system according to any one of claims 1, 2, 3, and 5 to 8, wherein a lens element located nearest to the object side in said second lens group is defined by a negative lens element, and the following condition is satisfied:

$$\nu_{21} < 40 \quad \cdots \text{(7)}$$

where ν_{21} is an Abbe's number of said negative lens element located nearest to the object side in said second lens group.

21. The zoom lens system according to claim 20, which satisfies the following condition:

$$\nu_{21} < 35 \quad \cdots \text{(8)}$$

where ν_{21} is the Abbe's number of said negative lens element located nearest to the object side in said second lens group.

22. The zoom lens system according to any one of claims 1, 2, 3, 5 to 8, 18 and 19, wherein said third lens group comprises, in order from an object side thereof, a positive lens component convex on an object side thereof and a cemented lens consisting of a positive lens element convex on an object side thereof and a negative lens element concave on an image side thereof, and said cemented lens and said positive lens on the object side are held in a lens barrel while the peripheral edges of the convex surfaces thereof abut peripherally or at peripheral several spots against the lens barrel.

23. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move constantly from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable during zooming, wherein said third lens group comprises a cemented lens consisting of a positive lens element and a negative lens element, said fourth lens group consists of one positive lens element, and the following condition (10) is satisfied:

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

24. The zoom lens system according to claim 23, wherein at least one surface of said positive lens in said fourth lens group is defined by an aspherical surface.

25. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed

during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move constantly from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable during zooming, wherein said second lens group, and said third lens group comprises a cemented lens consisting of a positive lens element and a negative lens element, and the following condition (10) is satisfied:

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \quad \cdots (10)$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

26. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move constantly from the image plane side to the object side

object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group having positive refracting power and designed to be movable during zooming, wherein said third lens group comprises, in order from an object side thereof, a positive lens component and a cemented lens consisting of a positive lens element and a negative lens element, and the following condition (10) is satisfied:

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \qquad \cdots (10)$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

27. A zoom lens system comprising, in order from an object side of said zoom lens, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein a spacing between said first lens group and said second lens group, a spacing between said second lens group and said third lens group, and a spacing between said third lens group and said fourth lens group varies upon zooming, said third lens group comprises, in order from an object side thereof, a double-convex positive lens component and a cemented lens consisting of a positive meniscus lens element convex on an object side thereof and a negative meniscus lens element, said fourth lens group comprises a double-convex lens element in which an object-

side surface thereof has a larger curvature, and the following condition (10) is satisfied:

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \qquad \cdots (10)$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

28. A zoom lens system comprising, in order from an object side of said zoom lens, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein a spacing between said first lens group and said second lens group, a spacing between said second lens group and said third lens group, and a spacing between said third lens group and said fourth lens group varies upon zooming, said first lens group consists of one positive lens component, said second lens group comprises three lens elements or one single lens element and a cemented lens consisting of a negative lens element and a positive lens element in order from an object side thereof, said third lens group comprises three lens elements or a single lens element and a cemented lens consisting of a positive lens element and a negative lens element in order from an object side thereof, said fourth lens group consists of one positive lens element, and the following condition (10) is satisfied:

$$2.5\ \mathrm{mm} < f_{B(min)} < 4.8\ \mathrm{mm} \qquad \cdots (10)$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

29. A zoom lens system comprising, in order from an object side of said zoom lens, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein a spacing between said first lens group and said second lens group, a spacing between said second lens group and said third lens group, and a spacing between said third lens group and said fourth lens group varies upon zooming, said first lens group comprises two lens elements or a positive lens element and a negative lens element, said second or third lens group includes therein a cemented lens component consisting of at least one set of a positive lens element and a negative lens element, and the following condition (10) is satisfied:

$$2.5\ \text{mm} < f_{B(min)} < 4.8\ \text{mm} \quad \cdots \text{(10)}$$

where $f_{B(min)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes shortest in a whole zooming space.

30. A zoom lens system comprising, in order from an object side of said zoom lens system, a first lens group

having positive refracting power and designed to be fixed during zooming, a second lens group having negative refracting power and designed to move from the object side to an image plane side of said zoom lens system for zooming from a wide-angle end to a telephoto end of said zoom lens system, a third lens group having positive refracting power and designed to move constantly from the image plane side to the object side for zooming from the wide-angle end to the telephoto end, and a fourth lens group consists of one lens element, having positive refracting power and designed to be movable during zooming, wherein said second lens group, and said third lens group comprises a cement lens component consisting of a positive lens element and a negative lens element, and said third lens group or said fourth lens group includes therein at least one aspherical surface.

31. A zoom lens system comprising, in order from an object side of said zoom lens, a first lens group having positive refracting power, a second lens group having negative refracting power, a third lens group having positive refracting power and a fourth lens group having positive refracting power, wherein a spacing between said first lens group and said second lens group, a spacing between said second lens group and said third lens group, and a spacing between said third lens group and said fourth lens group varies upon zooming, said first lens group consists of one positive lens element, said second lens group comprises three lens elements or a single lens element and a cemented lens consisting of a negative lens element and a positive lens

element in order from an object side thereof, said third lens group comprises three lens elements or a single lens element and a cemented lens consisting of a positive lens element and a negative lens element, and said fourth lens element consists of one positive lens element, with at least one aspherical surface introduced in said third lens group or said fourth lens group.

32. The zoom lens system according to any one of claims 1 to 8, 18, 23 and 25 to 31, which further satisfies the following condition:

$$2.5\ \text{mm} < f_{B(max)} < 4.8\ \text{mm} \quad \cdots (11)$$

where $f_{B(max)}$ is a length, as calculated on an air basis, of a final surface of a lens having power in said zoom lens system to an image plane of said zoom lens system, representing a figure at which said zoom lens system becomes longest in a whole zooming space.

33. An image pickup system including an objective optical system comprising a zoom lens system as recited in any one of claims 1 to 8, 18, 23 and 25 to 31, and an electronic image pickup device located on an image side of said zoom lens system.

add a1